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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/633,132	08/04/00	BASCERI C	M406 5.0139/

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DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP
2101 L STREET NW
WASHINGTON DC 20037-1526

EXAMINER	
LEE,E	
ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 04/25/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/633,132	BASCERI, CEM	
	Examiner	Art Unit	
	Eugene Lee	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 August 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *39-56 and 74-93* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *39-56 and 74-93* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other: .

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: on page 1, line 10, the word "of" is missing after the word "stoichiometry".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 39 thru 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laibowitz et al. '216 in view of Azuma et al. '363. Laibowitz discloses (see, for example, FIG. 7) a DRAM capacitor comprising a substrate 12, whereupon a mesa (at least one horizontal component and at least one vertical component) 51 and high dielectric film 56 are formed. Laibowitz does not disclose doping said BST dielectric film to maintain the stoichiometry of said film. However, Azuma discloses (see, for example, column 6, lines 35-45) that doping with additional A or B-site-type element in an ABO_3 dielectric, such as BST, of a DRAM capacitor will maintain the overall stoichiometric ratio of 1:1:3. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to dope A or B elements in the high dielectric film of Laibowitz so that an overall stoichiometry (1:1:3) can be maintained.

a. Regarding the limitation of "a BST film", even though Laibowitz does not

explicitly state the use of BST (or barium-strontium titanate), Azuma discloses in column 2, lines 44-* that BST is an important metal oxide used for dielectric films in DRAM capacitors. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use BST in Laibowitz's invention since BST provides the high dielectric constant needed to minimize the size of DRAM cells.

b. Regarding claim 44, Laibowitz in view of Azuma discloses the claimed invention except for a Ti percentage of about 50% to about 53.5% throughout said BST high dielectric film. However, it would have been obvious to one of ordinary skill in the art at the time of invention was made to dope with Ti until this range is met, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

4. Claims 48 thru 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laibowitz et al. '216 in view of Azuma et al. '363 as applied to claims 39 thru 47 above, and further in view of Leung et al. '762. Laibowitz in view of Azuma does not have a capping layer. However, Leung discloses that a capping layer may be formed to encapsulate a capacitor structure. See, for example, column 2, lines 27-56. Leung teaches that adding a capping layer protects the capacitor from diffusion and contamination. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include a capping layer in the capacitor structure of Laibowitz in view Azuma in order to prevent outdiffusion of the dielectric film and indiffusion (contamination) of unwanted species.

5. Claims 74 thru 93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hosotani et al. '859 in view of Azuma et al. '363. Hosotani discloses (see, for example FIG. 7B and column 12, lines 31-44) a capacitor comprising a substrate 31, first electrode 32, dielectric film 34, and second electrode 35. Hosotani does not disclose doping said dielectric film to maintain the stoichiometry of said film. However, Azuma discloses (see, for example, column 6, lines 35-45) that doping with additional A or B-site-type element in a ABO_3 dielectric of a DRAM capacitor will maintain the overall stoichiometric ratio of 1:1:3. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to dope A or B elements in the high dielectric film of Hosotani so that an overall stoichiometry (1:1:3) can be maintained.

Regarding claim 88, Hosotani in view of Azuma discloses the claimed invention except for a Ti percentage of about 50% to about 53.5% throughout said BST high dielectric film. However, it would have been obvious to one of ordinary skill in the art at the time of invention was made to dope with Ti until this range is met, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Product-by-Process Limitations

While not objectionable, the Office reminds Applicant that "product by process" limitations in claims drawn to structure are directed to the product, per se, no matter how actually made. *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also, *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wethheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al.*, 218 USPQ 289; and

particularly *In re Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or otherwise. Note that applicant has the burden of proof in such cases, as the above case law makes clear. Thus, no patentable weight will be given to those process steps which do not add structural limitations to the final product.

For example, in claim 40, the doping of the BST high dielectric film by "varying the implant angle of the dopant" is considered a method of depositing a dopant into the dielectric film and not limitation of the final structural product. Therefore, such a limitation is given no patentable weight.

INFORMATION ON HOW TO CONTACT THE USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 703-305-5695. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 703-308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Eugene Lee
April 20, 2001

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800